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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,115	07/25/2001	Brian Wells	130109.406	7456

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,115

Applicant(s)

WELLS, BRIAN

Examiner

Jonathan S. Crepeau

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1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-5, 7-23 and 30-33 is/are allowed.
- 6) ☒ Claim(s) 6, 24 and 26-29 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 2-33. Claims 2-5, 7-23, and 30-33 are allowed and claim 25 is objected to. Claims 6, 24, and 26-29 remain rejected for substantially the reasons of record. Accordingly, this action is made final.

Claim Rejections - 35 USC § 102

2. Claims 24, 26, 27, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Summers et al (U.S. Patent 3,808,534). Summers et al. is directed to a fuel cell system comprising a plurality of fuel cell stacks (70, 72, 74) connected in series (see Fig. 2). Pnp bipolar transistors (96, 114) are coupled to respond to a voltage across one of the stacks (see Fig. 2). Alarm circuits (nnp transistors 106, 120 and lamps 94, 112) are coupled to the collectors of pnp transistors 96, 114 (see col. 4, line 67; col. 5, line 38). Regarding claim 24, a first terminal (base) and a switching terminal (emitter) of transistor 96 are coupled across the fuel cell stack (see Fig. 2). Regarding claims 24 and 29, first and second indications are produced (i.e., lamp 94 is off or on) when voltage across stack 70 is higher or lower, respectively, than a predetermined level (i.e., one-half volt less than the voltage across stack 72) (see col. 5, line 21). Regarding claim 26, the emitter (switching terminal) of transistor 96 is connected to the anode (negative) side of stack 70 and the base of transistor 96 is connected to the positive (cathode) side of stack 70 (see Figs. 1 and 2). Regarding claim 27, the emitter (switching terminal) of transistor 96 is

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connected to the anode of stack 70 through a first resistor (100) and is connected to the cathode of stack 72 through a second resistor (98) (see Fig. 2).

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

3. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Summers et al.

The reference is applied to claims 24, 26, 27, and 29 for the reasons stated above.

However, the reference does not expressly teach the step of selecting the resistance of the first and second resistors (100, 98) to set the threshold voltage to a voltage in the range of 0.8-0.85 V, as recited in claim 28.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the reference provides sufficient guidance for the artisan to manipulate the resistance of the first and second resistors and the voltages of the fuel cell stacks so as to obtain a threshold voltage within the claimed range. First, it is known that the number of fuel cells in an individual stack may be varied according to the needs of the artisan. Summers recognizes this in column 4, line 54 ("For purposes of illustration, it will be assumed that each of the stacks 70, 72, 74 contains 11 fuel cells which produce one volt each"). Thus, the artisan may reduce the number of cells, and thus the total output voltage, of each stack. Additionally, the reference teaches in column 5, line 5 that "[r]esistor 100 is adjustable so that the emitter voltage of the transistor 96 may be varied." Hence, the reference provides sufficient guidance to adjust the voltage of the resistors as needed, based on the stack voltages and

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transistor activation voltages. Accordingly, Applicant's claimed step of selecting the resistances to result in a threshold voltage of 0.8 to 0.85V would be rendered obvious to a skilled artisan.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Summers et al. in view of Vitale et al (U.S. Patent 6,066,408).

Summers et al. is applied for the reasons stated in section 2 above. However, the reference does not expressly teach that the fuel cell stacks are comprised of solid polymer fuel cells, as recited in claim 6.

Vitale is directed to a cooler-humidifier plate for a PEM (i.e., solid polymer) fuel cell (see abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use PEM fuel cells as the fuel cells of Summers et al. In column 1, line 17, Vitale et al. teach the following:

electrical energy. PEM fuel cells offer many advantages over conventional means of generating electrical energy: they operate at relatively low temperatures and therefore require little or no warmup time; they are clean (their exhaust is typically water and air), they are quiet, they are efficient, and the typical source of fuel—hydrogen—is in abundant supply. Nevertheless, due to difficulties and costs in

Thus, the artisan would be motivated to use PEM fuel cells in the fuel cell stacks of Summers et al. in hopes of obtaining the advantages described by Vitale et al.

Response to Arguments

5. Applicant's arguments filed May 10, 2004 have been fully considered but they are not persuasive. With regard to claim 24, Applicants assert that Summers does not meet the claim limitations because the reference "teaches producing an indication if the *difference* between voltages across adjacent fuel cell stacks is greater than a threshold voltage." However, it is submitted that Summers does in fact anticipate the subject matter of claim 24. The claim requires producing first and second indications when the voltage across a fuel cell structure is greater than or less than a "predetermined voltage,." At column 5, line 21, Summers teaches that "[c]onsequently, the turning on of pilot lamp 94 indicates that the voltage across stack 70 is at least one-half volt lower than that across stack 72." The voltage across the stack 72 minus one-half volt corresponds to the instantly claimed "predetermined voltage," and the lamp is either off or on depending on whether the voltage of stack 70 is above or below this predetermined voltage. Thus, it is submitted that Summers does in fact anticipate claim 24.

Regarding claim 6, Applicants assert that Summers does not suggest reducing the number of fuel cells in a stack to two. However, claim 6 is open-ended and is not limited to stacks requiring only two PEM fuel cells. As such, this assertion is not persuasive. Additionally, Summers teaches, as an exemplary embodiment, that each stack comprises 11 fuel cells. However, the disclosure of Summers is not limited to such preferred embodiment. See MPEP §2123. Accordingly, it is believed that Summers also renders claim 6 obvious.

Allowable Subject Matter

6. Claims 2-5, 7-23, and 30-33 are allowed.
7. Claims 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The reasons for allowance of claims 2, 7, 12, 16, 25, and 32 were given in the previous Office action and remain applicable herein.

Claim 30 recites, among other features, that first and second transistors are electrically coupled across first and second sets of fuel cells. EP 982788, the closest prior art, teaches first and second transistors, but these are not “electrically coupled” across the fuel cells. As such, claim 30 is allowable.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jonathan Crepeau
Patent Examiner
Art Unit 1746
August 13, 2004